REMARKS/ARGUMENT

In the most recent Office Action, claims 22-32 were examined. Claims 22-32 stand rejected. Claims 22 and 32 are amended. Claims 28 and 31 are cancelled. Accordingly, claims 22-27, 29-30 and 32 are pending in the application. No new matter is added.

Disclosure

The title is objected to. Applicant submits a corrected title. Entry is respectfully requested as overcoming the objection.

Claim Rejections – 35 U.S.C. §112

Claims 28 and 31 are rejected under 35 U.S.C.§112, first paragraph, because, the Office Action states, the specification does not enable any person skilled in the art to which it pertains or with which it is most nearly connected, to make and use the invention. In particular, the Office Action states that the specification does not teach filtering a data file prior to a wavelet transform step. Claims 28 and 31 are cancelled without prejudice, thereby rendering the rejection of those claims moot.

Claim 31 is rejected under 35 U.S.C. §112, second paragraph for being indefinite. Claim 31 is cancelled without prejudice, thereby rendering the rejection of that claim moot.

Claim Rejections – 35 U.S.C. §101

The Office Action states that claim 31 is rejected under 35 U.S.C. §101 for non-statutory subject matter. Claim 31 is cancelled without prejudice, thereby rendering the rejection of that claim moot.

Claim Rejections – 35 U.S.C. §103

Claims 22 – 24 and 31 – 32 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kolarov et al. (U.S. Patent 6,144,773). Claims 25-26 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kolarov et al. in view of Ferriere (U.S. Patent No. 5,880,856). Claims 27 and 29 – 30 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kolarov

et al. in view of Ferriere and Said et al. (An Image Multiresolution Representation for Lossless and Lossy Compression, IEEE Transactions on Image Processing, Vol. 5, No. 9, September 1996). Claim 28 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kolarov et al, and further in view of Walker (U.S. Patent No. 6,222,881). The rejections are respectfully traversed. In each of the above rejections, the reference by Kolarov et al. is used as the main reference in establishing a *prima facie* case of obviousness, and appears to be the main obstacle to patentability for claims 22 – 32.

Claims 28 and 31 are cancelled without prejudice, thereby rendering the rejection of those claims moot.

Applicants note that claims 22 and 32 are modified to more clearly state the subject matter that the claims already contain. Entry is respectfully requested.

With regard to the present invention, it is first noted that the main feature of the present invention is that wavelet coefficients can be derived from an image represented by a number of bit sets, or data elements, with each of the data elements typically having the same number of bits. The wavelet coefficients are derived using modular arithmetic to preserve information and speed data transmission. The coefficients from the image represented by the data elements are themselves represented by a number of bits that are no more in number than the number of bits used to represent each of the data elements because of the modular arithmetic involved. This central feature of the present invention permits fast and compact transformation from data elements to wavelet coefficients, and is undisclosed in any of the cited prior art references. In independent claims 22 and 32, Applicants have specifically recited that each wavelet coefficient is "represented by a number of bits having a maximum count no greater than a number of bits representing each of said data elements." Accordingly, Applicants would like to specifically focus the examination of the present invention on this particular feature, and call to the Examiner's attention the fact that this feature is undisclosed in any of the cited prior art references.

In the Office Action, the Examiner states that Kolarov et al. disclose "performing a wavelet transformation of the data file to provide a series of wavelet coefficients, each of the coefficients being represented by a number of bits having a maximum count no greater than a

number of bits representing each of the data elements." The Examiner cites Figures 3a and 4a – 4c, as well as the description by Kolarov et al. at col. 19, line 19 – col. 20, line 13. In reaching this conclusion, the Examiner states only that the feature recited in the claims is provided by Kolarov et al., and relies on particular portions of that disclosure for support.

A review of Figure 3a and Figures 4a – 4c of the disclosure by Kolarov et al. reveals that the compression operations and procedures discussed are conducted on wavelet coefficients, rather than on pixels or other image representations. That is, the algorithm disclosed by Kolarov et al., especially in Figures 4a – 4c, focuses on operations performed ***after*** wavelet coefficients have already been obtained. Kolarov et al. reveal nothing with respect to obtaining the wavelet coefficients other than conventional techniques. Instead, Kolarov et al. explain how to reorganize and process wavelet coefficients that are obtained as a result of conventional wavelet transforms. It is the wavelet coefficients themselves that are processed in the zero-tree coding modification presented by Kolavov et al. as the central part of their invention, which provides a technique for ordering significant bits (represented by S(N)) to obtain the maximum amount of detail for a transferred representation in the shortest amount of time. This operation has nothing whatsoever to do with the generation of the wavelet coefficients themselves. Kolarov et al. only explain that for each bit plane that is output, significance bits are determined that correspond to wavelet coefficients according to the G-tree hierarchy disclosed by Kolarov et al. In short, Kolarov et al. never in fairness discuss a relationship between the number of bits in a data element and the number of bits in a wavelet coefficient derived from the image representation and fail to discuss any wavelet transformation other than conventional techniques. At most, Kolarov et al. give an example of how to generate significance bits to optimize transfer of information representing a function defined upon a selected geometric manifold. No relationship between the number of bits in a data element and the number of bits in a wavelet coefficient is even mentioned, let alone discussed in any meaningful way.

Indeed, the Office Action refers to the disclosure by Said – Pearlman that is incorporated by reference into the disclosure by Kolarov et al., which also reveals the information discussed in the disclosure by Kolarov et al. at col. 19, line 19 – col. 20, line 13, as cited in the Office Action. In particular, Kolarov et al. reference Algorithm II of Said – Pearlman as being analogous to the

algorithm disclosed in Figures 4a – 4c (col. 19, lines 25-32 and lines 55-64). Even a cursory examination of the reference by Said – Pearlman discloses that it is the conventionally obtained wavelet coefficients that are manipulated to transfer the maximum amount of information, i.e., the bits of significance, in the shortest amount of time. See section VI of Said – Pearlman, beginning on page 8. It is apparent that the disclosure by Kolarov et al. draws almost exclusively on the reference by Said – Pearlman to obtain an algorithm for generating significance bits as applied to a new type of data representation for a function on a manifold. Again, neither Kolarov et al. nor the reference by Said – Pearlman disclose a modular arithmetic wavelet transformation wherein each of the wavelet coefficients are represented by a number of bits that are no greater in number than the number of bits representing each of the data elements of the data file once the transformation is complete.

With regard to claims 22 – 24 and 32, Kolarov et al. is the only cited reference. With regard to claims 25 – 26, the combination of the disclosure by Kolarov et al. with that of Ferriere does not provide the feature of wavelet coefficients represented by a number of bits that are no greater in number than the number of bits representing the data elements of the data file. Accordingly, claims 25 – 26 are patentable over the disclosures by Kolarov et al. and Ferriere, either alone or in combination. With regard to claims 27 and 29 – 30, the combination of Kolarov et al. with Ferriere and Said et al. also fails to disclose wavelet coefficients that are represented with a number of bits that are no greater in number than the number of bits representing each of the data elements of the data file. Accordingly, claims 27 and 29 – 30 are patentable over the disclosures by Kolarov et al., Ferriere and Said et al., either alone or in combination.

In view of the above discussion, Applicants respectfully submit that claims 22 –27, 29-30 and 32 are patentable over the cited prior art references, either alone or in combination, and respectfully request that the rejection of claims 22 –27, 29-30 and 32 under 35 U.S.C. §103(a) be reconsidered and withdrawn.

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CONCLUSION

Applicants respectfully believe that the foregoing is a complete and accurate response to all issues raised in the most recent Office Action. The independent claims remain unamended as it is believed that they recite patentable subject matter, and thus do not raise any new issues or require further search. In view of the above discussion and amendments, Applicants respectfully believe that the present application is now in condition for allowance, and earnestly solicits notice to that effect. If it is believed that an interview would contribute to allowance of the claims, the Examiner is requested to contact the undersigned counsel at the number provided below.

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June 9, 2003
Date of Signature

Respectfully submitted,

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